

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A balloon catheter, comprising:
  - a) an elongated shaft having an inflation lumen, and a guidewire receiving lumen, and
    - i) a proximal shaft section comprising a proximal tubular member having a proximal end, a distal end, and a distal portion, and defining a proximal portion of the inflation lumen;
    - ii) a distal shaft section comprising an outer tubular member having a proximal end and a distal end, and defining a distal portion of the inflation lumen, and an inner tubular member having a proximal end, a distal end, and a proximal portion in a side-by-side relationship with the distal portion of the proximal tubular member, the inner tubular member extending within the distal portion of the inflation lumen and beyond the distal end of the outer tubular member and defining the guidewire lumen in communication with a guidewire distal port at a distal end of the catheter shaft and a guidewire proximal port at the proximal end of the inner tubular member; and
    - iii) a polymeric tubular reinforcing member on an inner surface of the distal portion of the proximal tubular member, having a proximal end, a distal end, and a length, and being formed of a first polymeric material having a glass transition temperature greater than a glass transition temperature of a second polymeric material forming the distal portion of the proximal tubular member, and defining along the entire length of the polymeric tubular reinforcing member an inner-most surface of the shaft extending along and defining the circumferential perimeter of the inflation lumen from the proximal to the distal end of the polymeric tubular reinforcing member [[,]]; and

b) a balloon on the distal shaft section, having an interior in fluid communication with the inflation lumen.

2. (original) The balloon catheter of claim 1 wherein the first polymeric material forming the polymeric reinforcing member is selected from the group consisting of thermoset polyimide, and thermoplastic polyimide.

3. (original) The balloon catheter of claim 1 wherein the first polymeric material forming the polymeric reinforcing member is thermoset polyimide.

4. (original) The balloon catheter of claim 1 wherein the glass transition temperature of the first polymeric material forming the polymeric reinforcing member is about 380° C to about 450° C.

5. (original) The balloon catheter of claim 1 wherein the second polymeric material forming the distal portion of the proximal tubular member is selected from the group consisting of nylon, polyether block amide, polyurethane, and adhesive polymer.

6. (cancelled).

7. (cancelled).

8. (cancelled).

9. (original) The balloon catheter of claim 1 wherein the polymeric reinforcing member has a length about equal to the length of the proximal portion of the inner tubular member.

10. (cancelled).

11. (cancelled).

12. (cancelled).

13. (cancelled).

14. (cancelled).

15. (cancelled).

16. (cancel)

17. (currently amended) The balloon catheter of claim [[16]] 1 including a support mandrel within at least a section of the inflation lumen, with a distal section extending along an inner or outer surface of the polymeric reinforcing member.

18. (original) The balloon catheter of claim 17 wherein the support mandrel extends within the proximal tubular member and adjacent to the outer surface of the polymeric reinforcing member therein, and is bonded to the outer surface of the polymeric reinforcing member.

19. (original) The catheter of claim 18, wherein the support mandrel is secured to an inner surface of the proximal tubular member.

20. (cancelled).

21. (original) The balloon catheter of claim 17 wherein the support mandrel has a distal end embedded within polymeric material of the shaft.

22. (cancelled).

23. (original) The balloon catheter of claim 1 including a support mandrel in the shaft extending adjacent to an outer or inner surface of the polymeric reinforcing member.

24. (original) The balloon catheter of claim 23 wherein the support mandrel is about 110 to about 125 cm long.

25. (original) The balloon catheter of claim 1 wherein the distal portion of the proximal tubular member and the proximal portion of the inner tubular member are heat fused together.

26. (original) The balloon catheter of claim 23, wherein the support mandrel is formed of a material selected from the group consisting of stainless steel, nickel titanium, polyetherether ketone, and nylon.

27. (original) The balloon catheter of claim 1 wherein the proximal portion of the inner tubular member is parallel to the distal portion of the proximal tubular member.

28. (original) The balloon catheter of claim 1 wherein the polymeric reinforcing member is a tube having a length of about 2 to about 10 cm.

29. (original) The balloon catheter of claim 1 wherein the polymeric reinforcing member is a tube having a wall thickness of about 0.01 to about 0.03 mm.

30. (currently amended) A rapid exchange balloon catheter, comprising:  
a) an elongated shaft having a proximal shaft section, a distal shaft section, an inflation lumen, and a guidewire lumen extending in the distal shaft section, and  
i) a proximal tubular member having a proximal end, a distal end, and a distal portion, and defining a proximal portion of the inflation lumen;

ii) a distal outer tubular member having a proximal end, a distal end, and a proximal section secured to a distal section of the proximal tubular member, and defining a distal portion of the inflation lumen;

iii) a distal inner tubular member extending within the distal portion of the inflation lumen in the distal outer tubular member and beyond the distal end of the distal outer tubular member, defining the guidewire lumen in fluid communication with a guidewire proximal port at the proximal end of the inner tubular member and a guidewire distal port at the distal end of the catheter, and having a proximal end, a distal end, and a proximal portion in a side-by-side relationship with the distal portion of the proximal tubular member; and

iv) a polymeric reinforcing tube within the distal portion of the proximal tubular member, formed of a thermoset polyimide material, and having a length and defining along the entire length of the polymeric reinforcing tube an inner-most surface of the shaft extending along the inflation lumen; and

~~b) a support mandrel within at least a section of the inflation lumen, with a distal section extending along an inner or outer surface of the polymeric reinforcing tube; and~~

e) a balloon on the distal shaft section, having an interior in fluid communication with the inflation lumen.

31. (original) The balloon catheter of claim 30 wherein the thermoset polyimide material has a glass transition temperature greater than a glass transition temperature of a polymeric material forming the distal portion of the proximal tubular member

32. (original) The balloon catheter of claim 30 wherein the thermoset polyimide material has a glass transition temperature greater than a glass transition temperature of a polymeric material forming the proximal portion of the distal inner tubular member.

33. (original) The balloon catheter of claim 30 including a support mandrel in the shaft extending adjacent to an outer or inner surface of the thermoset polyimide reinforcing member.

34. (cancelled) .

35. (original) The balloon catheter of claim 30 wherein the proximal portion of the inner tubular member and the distal portion of the proximal tubular member are fusion bonded together.

36. (cancelled) .

37. (currently amended) A catheter, comprising an elongated shaft having a first lumen, and a second lumen, and having

a) a proximal shaft section comprising a proximal tubular member having a proximal end, a distal end, and a distal portion, ~~and defining the proximal tubular member having at least a portion which defines an inner-most surface of the shaft and which is located proximal to a polymeric tubular reinforcing member, so that the proximal tubular member defines~~ a proximal portion of the first lumen;

b) a distal shaft section comprising an outer tubular member having a proximal end and a distal end, and defining a distal portion of the first lumen, and an inner tubular member having a proximal end, a distal end, and a proximal portion in a side-by-side relationship with the distal portion of the proximal tubular member, the inner tubular member extending within the distal portion of the first lumen and beyond the distal end of the outer tubular member and defining the second lumen in fluid communication with a distal port at a distal end of the catheter shaft and a proximal port at the proximal end of the inner tubular member; and

c) ~~[[a]]~~ the polymeric tubular reinforcing member being located within the proximal portion of the inner tubular member or the distal portion of the proximal tubular member, and formed of a first polymeric material having a glass transition

temperature greater than a glass transition temperature of a second polymeric material forming the distal portion of the proximal tubular member.

38. (previously presented) The catheter of claim 37 wherein the first polymeric material is a polyimide and the second polymeric material is not a polyimide.

39. (original) The catheter of claim 37 wherein the first polymeric material is a thermoset polyimide.

40. (previously presented) The balloon catheter of claim 1 wherein the polymeric reinforcing member has a proximal end located proximal to the guidewire proximal port.

41. (cancel)

42. (previously presented) The balloon catheter of claim 1 wherein the polymeric tubular reinforcing member has a shape which is configured to correspond to a shape of the proximal portion of the inner tubular member or the distal portion of the proximal tubular member, and which is selected from the group consisting of a circular, oblong, D-shaped, and C-shaped transverse cross sectional shape.

43. (currently amended) A balloon catheter, comprising:

a) an elongated shaft having an inflation lumen, and a guidewire receiving lumen, and

i) a proximal shaft section comprising a proximal tubular member having a proximal end, and a distal end, and the proximal tubular member having at least a portion which defines an inner-most surface of the shaft and which is located proximal to a polymeric tubular reinforcing member within the proximal tubular member, so that the proximal tubular member defines and defining a proximal portion of the inflation lumen;

ii) a distal shaft section comprising an outer tubular member having a proximal end and a distal end, and defining a distal portion of the inflation lumen, and an inner tubular member having a proximal end, a distal end, and a proximal portion in a side-by-side relationship with the inflation lumen, the inner tubular member extending within the inflation lumen and beyond the distal end of the outer tubular member and defining the guidewire lumen in communication with a guidewire distal port at a distal end of the catheter shaft and a guidewire proximal port at the proximal end of the inner tubular member; and

iii) ~~[[a]]~~ the polymeric tubular reinforcing member being within ~~which is on an inner surface of~~ a portion of the proximal tubular member located radially adjacent to the guidewire proximal port so that the polymeric tubular reinforcing member extends across the guidewire proximal port, and ~~which is~~ being formed of a first polymeric material having a glass transition temperature greater than a glass transition temperature of a second polymeric material forming the portion of the proximal tubular member located adjacent to the guidewire proximal port; and

b) ~~a support mandrel within at least a section of the inflation lumen, with a section extending along an inner or outer surface of the polymeric reinforcing member; and~~

e) a balloon on the distal shaft section, having an interior in fluid communication with the inflation lumen.

44. (previously presented) The balloon catheter of claim 43 wherein the first polymeric material forming the polymeric reinforcing member is selected from the group consisting of thermoset polyimide, and thermoplastic polyimide.

45. (previously presented) The balloon catheter of claim 44 wherein the second polymeric material forming the portion of the proximal tubular member located adjacent to the guidewire proximal port is selected from the group consisting of nylon, polyether block amide, polyurethane, and adhesive polymer.



46. (previously presented) The catheter of claim 37 wherein the glass transition temperature of the first polymeric material is about 300 to about 450°C, and the glass transition temperature of the second polymeric material is about 30 to about 60°C.